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## Commentary: “Never, never, never give up?”

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In patients presenting acute type A aortic dissection (ATAAD), cardiac arrest occurs not infrequently before they enter the operating theater, the incidence of which is known to range from 3.8% to 5.6% according to previous studies. Several previous papers revealed very dismal outcomes for these patients, with varying survival rates of 4.7% to 56.8%.<sup>1-4</sup> Such diverging survival rates in the published series may be attributable to differing surgical indications of each institutions, and actual incidence of cardiac arrest in ATAAD may also be underestimated due to patient selection before transportation to operating theater. There are many who regard surgery on this population as futile, and an aggressive surgical approach has been rarely employed for this extremely high-risk clinical condition. Meanwhile, in some Asian countries having unique demographics with intensive population distribution, vigorous efforts have been made to manage these patients with aggressive surgical therapy. In this issue of the *Journal*, single institutional outcomes of surgery for patients with ATAAD who experienced preoperative cardiac arrest were reported from the National Cerebral and Cardiovascular Center in Japan, where extraordinary efforts were made to promptly manage these patients surgically.<sup>5</sup>

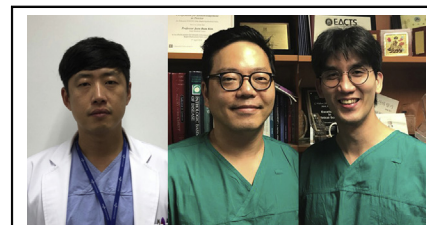
In this paper, of 519 patients who underwent surgical repair of ATAAD between 2004 and 2018, a focused evaluation was performed on 34 patients who required cardiopulmonary resuscitation (CPR) before surgery. Operative mortality occurred in 21 patients (61.9%), and 6

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Chee-hoon Lee, MD (left), Sung Jun Park, MD (right), and Joon Bum Kim, MD, PhD (center)

### CENTRAL MESSAGE

This study indicates that there is a chance of survival free of neurologic sequel in ATAAD presenting with cardiac arrest if surgical therapy is offered within 15 minutes of arrest.

(19.4%) of 13 survivors were free of neurologic sequelae, whereas 7 patients who remained in a coma even survived. Characteristics and duration of CPR and restoration profiles were also minutely elucidated in this paper. The survivors showed significantly shorter duration of CPR than nonsurvivors ( $P = .044$ ) and ongoing CPR at the beginning of surgery ( $P = .039$ ), and no restoration even after pericardiotomy ( $P = .045$ ) were more frequent in the nonsurvivor group. Finally, based on the multivariable analysis, which revealed duration of CPR beyond 15 minutes as a significant risk factor for operative mortality, the authors suggest not to proceed with surgical repair of ATAAD when the CPR duration exceeds 15 minutes.

The authors are to be highly commended for their vigorous efforts to provide prompt treatment in these very challenging patients. Of note, the authors achieved an extraordinarily brief time from hospital arrival to the operating room, with median duration of 24 minutes. Although their overall results are inferior to the recent report from an international registry from Nordic area (30-day mortality of 43.2%),<sup>6</sup> they may be explained by differing surgical eligibility criteria and patient selection strategy depending on individual institutions. In the study, a paradoxically greater mortality rate was observed in in-hospital cardiac arrest (72.2%) than out-of-hospital (50.0%). To further improve outcomes in these patients, applying extracorporeal CPR may be of help in well-selected cases if with fair peripheral

access. In the study, there were 14 (41.2%) patients who required ongoing CPR at the beginning of surgery; however, only 4 of them received preoperative extracorporeal membrane oxygenation support. This seems to leave further room for research on the role of preoperative extracorporeal CPR in these patients.

Due to small number of patients analyzed in the statistical model, there are several limitations to draw a rigorous conclusion from this study. Nevertheless, there is no doubt that the present study by Uehara and colleagues offers valuable information to understand the role of surgery in this devastating condition. Further study with a larger sample size from multiple centers may suggest stronger guidance to determine optimal treatment strategy.

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## Commentary: The outer limits

Dawn S. Hui, MD

“Primum nil nocere.” If cardiac surgeons lived purely by the dictum of “first do no harm,” our discipline would not exist. All maneuvers performed by cardiac surgeons carry inherent risk due to the invasive nature of the profession. Ethically, we reconcile this using the concept of the risk/benefit ratio; interventions are justified when the calculated balance is acceptable to both the surgeon and patient. This requires the grave responsibility of the physician to “tell the antecedents, know the present, and foretell the future” (Hippocrates, “Of the Epidemics”).<sup>1</sup> In the modern era, we have the benefit of shared evidence to help inform these responsibilities.

As to these calculations, acute type A aortic dissections are a unique situation. The wide gap between the acute dismal natural history of the disease and the survival



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### CENTRAL MESSAGE

Survival of acute type A aortic dissection patients requiring CPR prior to surgical repair is extremely low.

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potential with surgical intervention makes rapid decision-making and deployment of resources generally straightforward. For a majority of cases, the surgeon can feel assured that benefit can be offered, and that the benefit is of major worth, namely prevention of death. Neurologic outcome and avoidance of comorbidity are less assured, but these are outweighed by the value of life. In this issue of the *Journal*, Uehara and colleagues<sup>2</sup> explore the most difficult, challenging subgroup of patients with acute type A aortic dissections—those who present with recent